September 2006

Hedge funds activity and influence on the foreign exchange market[1]

1. Introduction

According to results of the BIS Triennial FX market survey between 2001 and 2004 the turnover in the foreign exchange market has surged by 56% (16% p.a.) and reached a daily average of $1880 billion in April 2004.

The growth of FX turnover was even more dynamic. Between October 2004 and 2005 total average daily FX turnover in UK and US increased by 34%.[2] The share of UK and US in global FX turnover amounted to 50.5% in April 2004, which makes this group fairly representative for the general tendencies.

If the pace of world FX turnover increase in the recent years had been 16% p.a. (as between 2001-2004) the global turnover would amount to USD 2530 billion in April 2006. If it had been equal to the growth rate in UK and US last year then the global FX turnover would amount to $3375 billion.

What stands behind this rise?

According to the 2004 BIS survey the largest increase in absolute terms was recorded in turnover between banks (USD 288 billion or 40.7%), though their relative share in fell within 3 years by 6%. The most significant increase in percentage terms was recorded in turnover of the reporting banks with *other financial institutions*, which increased by $256 billion or 77.8% (21% p.a.).

[1] This note has been prepared by Martin Beck, Deutsche Bundesbank, and Marek Marciniak, National Bank of Poland. It represents the authors' personal opinions and do not necessarily reflect the views of the Deutsche Bundesbank and the National Bank of Poland or its staff.

As BIS explains the group *other financial institutions* gathers mainly big institutional players (insurance and pension funds), hedge funds, commodity trading advisors (CTAs), proprietary trading desks and currency overlay managers (COMs). Anecdotal evidence suggests that leveraged investors (i.e. those mentioned above excluding the first group) have recoded the highest dynamics of turnover. This is consistent with the results of the latest FX Poll by Euromoney, which revealed a significant increase in turnover between 2004 and 2005 and a rising size of the average turnover per institution. Leveraged funds were one of the main contributors to this increase. Their presence in the survey increased by 63% and their total turnover was more than doubled. Although these statistics must be taken cautiously, they do generally correspond to the consensus view on the foreign exchange development last year.

Similar evidence is provided by the TASS database. Although the share of hedge funds speculating in the foreign exchange market remained relatively stable in recent years, their assets under management (AUM) rose significantly in line with the overall rise in the hedge fund industry. A detailed discussion of empirical findings based on this database is provided in Section 3.

Given the abruptly rising share of leveraged funds in the foreign exchange market (up to 36.6% according to Euromoney estimates), hedge funds – virtually representing this group – may have a steadily increasing influence on the FX market developments.

2. Hedge Fund Strategies

The most active hedge funds in the FX market generally follow a few basic strategies. They include:

- macro strategies (value forecasting),
- carry trades (return forecasting),
- momentum trading (trend following),
- volatility trading (non-directional speculation).

[2] See Foreign Exchange Committee (2004,2005), FX volume survey results, October 2004, April 2005, October 2005, New York.

Funds are commonly managing their portfolios actively trying to generate alpha, but nevertheless within each strategy the positions taken by different funds often tend to be similar. The main reason for this is the fact that virtually all hedge fund managers make their investment decisions with the same information available and on the basis of similar analytical approaches (indicators, data interpretation, basic forecasting methods). Trends in the FX markets tend to encourage further positioning, thus strengthening and prolonging themselves. This phenomenon is usually referred to as the “bandwagon effect” or “herding behaviour” of investors. The capability of hedge funds to affect market dynamics results also from the fact that some “traditional investors” tend to replicate the strategies of hedge funds. The reason for such behaviour might simply be historical performance of hedge funds.

The main investment strategies are described below in some more detail and the potential influence of hedge funds following them is analysed.

Macro hedge funds

Macro hedge funds have potentially the broadest trading mandate possible.[3] Macro funds generally analyse macroeconomic indicators and try to identify fundamentally under- or overvalued assets. This can in general be positive for market efficiency and stability as macro funds are actually most likely to take contrarian positions thus mitigating the risk of overshooting the equilibrium value of asset prices. In this context, computer based quantitative models following mean reversion strategies can contribute to smooth price fluctuation. On the other hand, some macro fund managers combine relative value trading and value investing with directional strategies. As a result their fundamental-based positions will be liquidated only if the currency trends show signs of weakening, thus supporting the probability of excessive appreciation or depreciation.

Carry traders

Carry trades have become a popular trading strategy generating high returns since the late nineties. The strategy is basically a directional bet on a high yielding

currency. In recent years carry trades contributed to maintain long-term trends in emerging market currencies. However, a narrowing of spreads between the investment assets and the funding costs or the depreciation of the high-yielding currency against the funding currency might force funds to unwind their carry trade positions potentially causing crowded trades and reverse currency trends. With the narrowing of credit spreads many hedge funds started to unwind carry trades in 2005 (see also Figure 12).

Trend following (momentum) funds and automated trading

This group consists mainly of CTAs and other funds making their decisions on the basis of technical analysis and extrapolative forecasting. By definition funds from this group do not initiate trends themselves, but rather exploit opportunities to follow other investors (e.g. macro funds). Momentum traders keep their positions as long as the market sentiment has not changed and are often the last ones to withdraw. If the market participants realize that this is the case and a counter-adjustment begins momentum funds "jump in" to follow a new trend. Momentum funds will therefore generally contribute to prolong trends and amplify price movements. In recent years the activities of momentum funds in the FX markets have considerably increased, where automated trading is increasingly used in implementing momentum strategies.

However, much existing autotrading activity is not so much due to traders' attempts to capture directional moves in the market, but to various forms of arbitrage activity and non-directional strategies.

3. Hedge funds activity in the FX market – statistical evidence

Methodological remarks

Results presented in this section are based on two main sources: Tremont Asset Flows Reports by Tremont Capital Management and Lipper TASS database.[4] Information on total net assets of hedge funds is derived from the former, whereas a more detailed analysis of the structure of the hedge fund industry is based on the latter.

[3] Warsager, Duncan (2004)
[4] Formerly Tremont TASS. See www.lipperweb.com.

According to estimates by Tremont global net hedge funds assets amounted to USD 1.15 trillion at the end of March 2006.[5] The TASS database covers hedge funds with ca. USD 525.5 billion of net assets (without fund of funds), about 46% of the entire industry. The percentage values derived from TASS database are projected on the absolute values from the Flow Reports to approximate the true scale of the discussed phenomena.

Commercial databases provide the most comprehensive and detailed information on hedge funds. However, data accuracy and consistency are critical issues with commercial databases including the TASS database. Thus, we tried to eliminate at least some of the data inconsistencies by dropping data with implausible information. Moreover, hedge fund databases are in general subject to various biases. The most severe examples are the survivorship bias (closed funds dropping out of the sample), self selection bias (when hedge fund managers decide if they report to the database or not) and backfill bias (when a hedge fund is added to the data base).

Results

Between the end of 2000 and 2005 hedge funds' assets under management (AUM) increased by approx. 90% from USD 520 bn to ca. USD 1,000 bn (see Figure 2). The most dynamic development experienced emerging markets, global macro and event driven funds (in percentage terms), whereas the market share of equity market neutral and dedicated short bias declined (see Figure 4). Hedge fund strategies with the highest returns attracted relatively large capital inflows thus increasing their share within the industry.

Table 1 shows the share of funds with foreign exchange included in assets and the indication if this is for hedging purposes only. The difference between both can be considered as the share of funds (weighted by capital) which speculate in the FX market. In recent years this ratio has been relatively stable at around 25-30% but given the surge in total hedge fund assets the capital of speculative funds rose significantly (see Figure 5).

The share of funds using FX not only for hedging purposes is the highest in global macro, managed futures and emerging markets strategies (see Figure 6). This result

[5] See Tremont Capital Management (2006).

is quite intuitive as emerging markets and global macro funds are by definition at least partially invested in currencies and managed futures funds invest in all kinds of exchange traded derivative instruments.

Although the share of funds with primary focus on currencies has been gradually falling AUM of these funds have risen more than 250% since 1998 (see Figure 7). A breakdown by strategy reveals a clear dominance of managed futures and global macro funds (Figure 8). In particular managed futures strategies utilize automated trading systems, which – according to anecdotal evidence – have been booming in recent years. This is in line with the information on the investment approaches used by funds with primary focus on currencies presented in Figure 9.

Figure 10 shows that funds with primary focus on currencies make widespread use of derivative instruments. This is consistent with fact that hedge funds usually leverage their positions (off-balance sheet leverage).

From the statistics described above some conclusions on the relative significance of hedge fund strategies in the FX market can be drawn. However, the presented descriptive data can not provide much information concerning various important strategies such as carry trades.

Carry trades

The significance of carry trades within each strategy can be analysed by calculating correlations of hedge fund returns with returns of an “carry trade index”. For this purpose the Deutsche Bank Global Currency Harvest Index has been used. The index tracks total returns for local-currency-denominated high yielding fixed income instruments. The index values and monthly returns are presented in Figure 11.

For several years correlations of returns of hedge funds, which potentially follow carry trade strategies, with the DB Global Currency Harvest Index have been positive. However, until the beginning of 2005 correlations decreased substantially indicating the unwinding of carry trades in an environment of historically low credit spreads. With the drawback from carry trades many hedge funds focused on volatility and correlation trades.

Correlation of returns and crowded trades

From a financial stability perspective also correlations of returns *within* strategies have become an important issue in recent years (see ECB 2005b/c, ECB 2005a/b). This is mainly due to the fact that concurrent returns may indicate a crowding of trades which – in case of a major turmoil in financial market – might pose a significant systematic risk when hedge funds attempt to unwind their positions at the same time.

Figure 13 to 19 present median piecewise correlations of funds within strategies and their subgroups with FX exposure.[6]

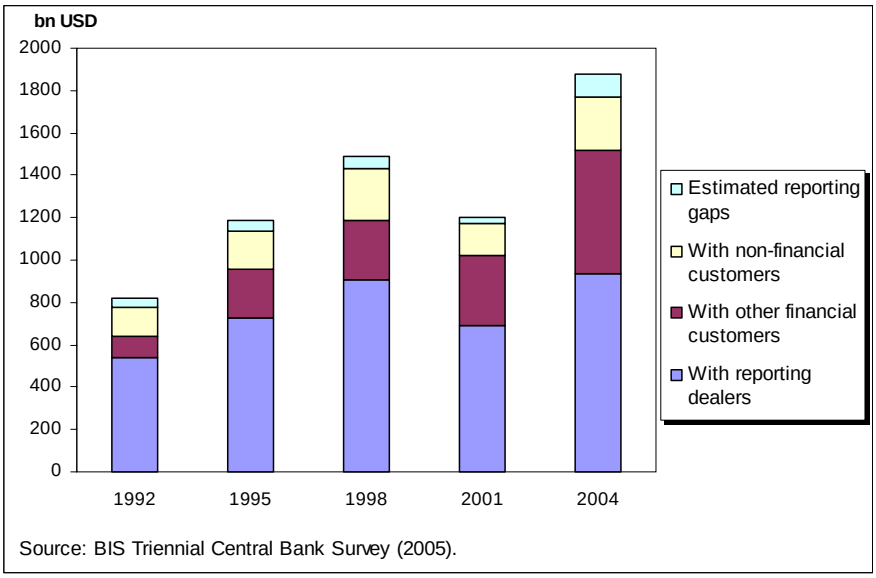
Between 2001 and 2005 correlations of fund returns (all strategies) have increased significantly - from ca. 0.05-0.10 to 0.20-0.25. Returns of funds with FX exposure did not exhibit higher co-movements in general. The most significant increase of median pair-wise correlations was recorded for long/short equity and multi strategy funds. Correlations within global macro and emerging market funds did not show any tendency but significant volatility of coefficients was recorded, especially in case of emerging market funds. Correlations of funds with currencies included in assets did not systematically differ from these results.

The highest increase of correlations was recoded within funds of funds (Figure 19). This phenomenon might partly due to similar selection of single funds by fund of funds (survivorship of the fittest) rather than increasing correlation between selected single funds.

[6] Funds with currencies included in assets not only for hedging purposes.

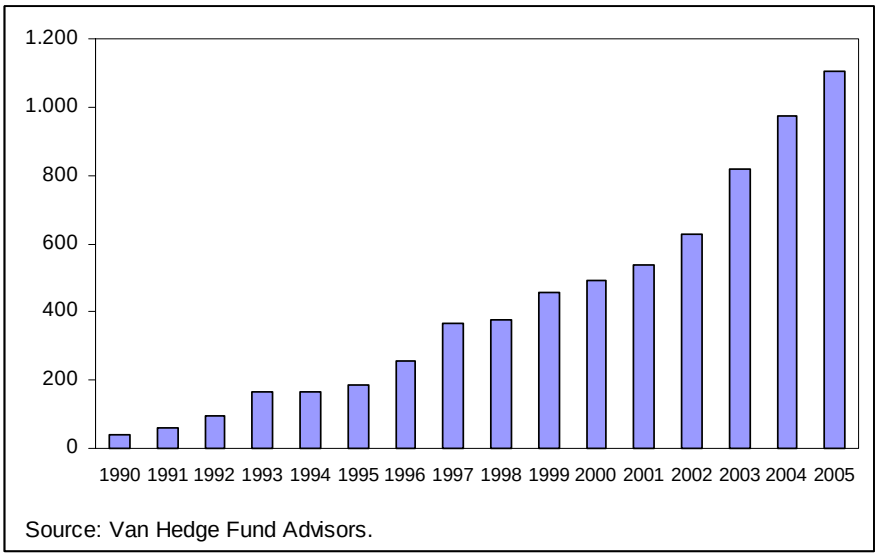
Statistical annex

Figure 1: Daily FX turnover (daily averages in April)



Source: BIS Triennial Central Bank Survey (2005).

Figure 2: Hedge funds capital under management, USD billion



Source: Van Hedge Fund Advisors.

Figure 3: Performance of hedge funds – CSFB Tremont Indices

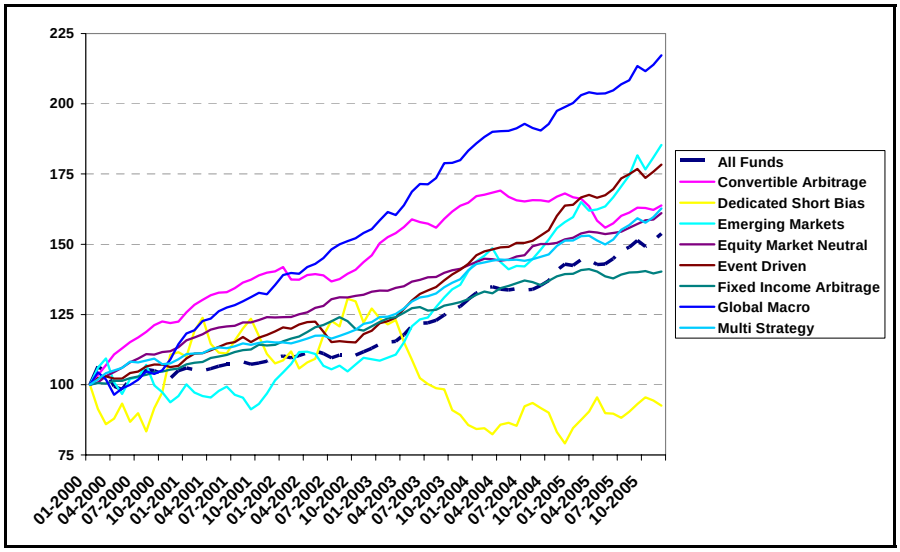
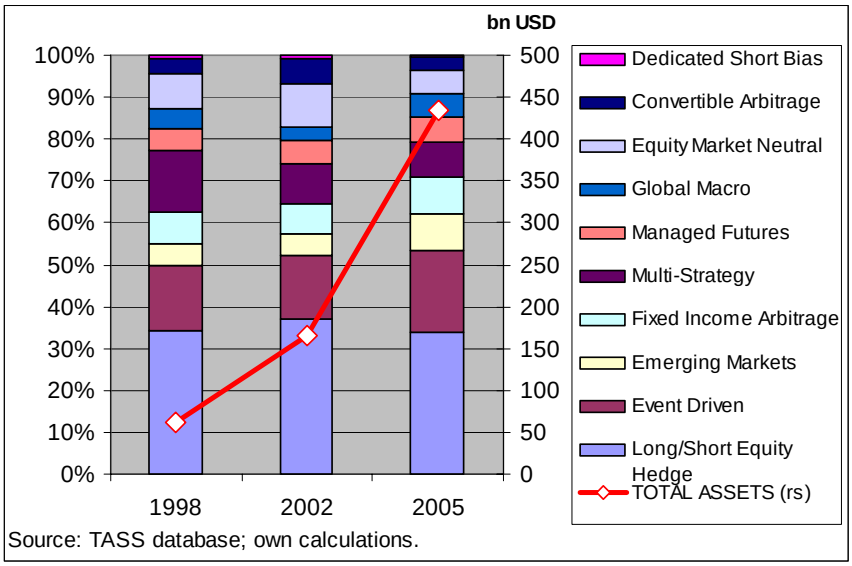


Table 1: Assets of hedge funds by strategy (USD bn) and share of funds with currencies included in assets

Strategy	1998	1999	2000	2001	2002	2003	2004	2005
Directional								
Long/Short Equity Hedge	**20.83**	**34.77**	**49.01**	**58.21**	**61.33**	**77.94**	**113.17**	**147.44**
of which: FX incl. in assets	42.7%	44.6%	46.9%	48.7%	51.3%	52.2%	51.1%	49.7%
FX for hedging on	7.1%	10.5%	17.2%	23.1%	24.4%	22.6%	21.7%	23.3%
primary FX focus	5.4%	5.0%	3.7%	3.3%	3.7%	4.4%	3.9%	3.5%
Global Macro	**2.91**	**2.73**	**2.85**	**3.75**	**5.57**	**16.17**	**20.04**	**24.19**
of which: FX incl. in assets	98.7%	99.0%	98.9%	97.6%	97.5%	98.4%	96.0%	92.1%
FX for hedging on	3.0%	5.0%	6.6%	6.9%	15.1%	11.3%	13.2%	7.8%
primary FX focus	88.6%	80.4%	76.5%	69.2%	66.3%	76.3%	59.3%	45.8%
Emerging Markets	**3.14**	**6.19**	**4.90**	**5.94**	**8.23**	**17.26**	**26.64**	**38.79**
of which: FX incl. in assets	45.4%	47.2%	59.5%	60.1%	60.8%	58.3%	56.3%	55.4%
FX for hedging on	23.2%	29.9%	29.7%	25.1%	22.0%	20.2%	19.7%	19.8%
primary FX focus	0.8%	0.7%	1.6%	4.7%	6.5%	6.1%	6.0%	5.7%
Dedicated Short Bias	**0.54**	**0.73**	**1.00**	**0.92**	**1.03**	**0.68**	**0.85**	**1.49**
of which: FX incl. in assets	0.6%	0.3%	0.1%	0.1%	0.8%	2.2%	2.1%	0.6%
Managed Futures	**3.21**	**3.95**	**4.02**	**6.06**	**9.13**	**17.50**	**25.87**	**26.54**
of which: FX incl. in assets	98.6%	97.7%	95.6%	91.9%	91.9%	93.3%	89.4%	82.4%
FX for hedging on	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
primary FX focus	89.9%	82.3%	80.5%	70.9%	70.6%	72.3%	64.9%	61.6%
Event Driven	**9.59**	**10.96**	**14.51**	**21.69**	**24.83**	**39.74**	**62.12**	**83.41**
of which: FX incl. in assets	65.8%	61.0%	61.5%	58.1%	64.2%	57.6%	50.9%	51.1%
FX for hedging on	45.1%	41.6%	43.0%	42.4%	47.1%	43.6%	39.7%	40.5%
primary FX focus	7.0%	5.7%	5.7%	4.7%	5.2%	4.0%	2.9%	3.2%
Market Neutral								
Fixed Income Arbitrage	**4.66**	**5.22**	**5.07**	**7.27**	**12.15**	**18.66**	**29.37**	**37.18**
of which: FX incl. in assets	32.1%	21.1%	29.1%	31.1%	33.7%	43.5%	43.2%	42.5%
FX for hedging on	32.6%	21.6%	28.1%	28.3%	28.9%	30.3%	30.9%	32.8%
primary FX focus	0.2%	0.1%	1.3%	4.8%	7.8%	13.3%	13.9%	13.6%
Equity Market Neutral	**4.96**	**7.26**	**10.04**	**14.74**	**16.84**	**19.89**	**24.26**	**23.74**
of which: FX incl. in assets	56.2%	59.6%	60.2%	53.2%	49.1%	46.4%	46.0%	42.1%
FX for hedging on	39.4%	42.4%	38.5%	30.3%	30.4%	30.2%	29.2%	30.2%
primary FX focus	0.0%	0.1%	0.1%	1.3%	1.4%	1.6%	0.1%	0.3%
Convertible Arbitrage	**2.18**	**2.61**	**3.01**	**8.15**	**10.19**	**15.58**	**18.75**	**14.02**
of which: FX incl. in assets	42.9%	35.1%	33.6%	63.1%	57.7%	52.9%	56.0%	61.4%
FX for hedging on	42.4%	34.6%	32.9%	59.2%	48.9%	39.8%	43.9%	49.6%
primary FX focus	6.3%	5.4%	5.1%	2.4%	3.8%	4.8%	4.5%	4.4%
Multi-Strategy	**9.04**	**10.92**	**9.94**	**13.19**	**15.77**	**22.83**	**33.00**	**36.87**
of which: FX incl. in assets	83.5%	77.8%	68.3%	66.7%	60.7%	55.2%	47.9%	43.7%
FX for hedging on	22.7%	20.6%	29.0%	27.9%	25.5%	25.7%	31.0%	28.5%
primary FX focus	54.5%	50.5%	27.8%	25.4%	21.8%	16.7%	9.1%	9.7%
Total	**61.07**	**85.33**	**104.37**	**139.91**	**165.06**	**246.25**	**354.08**	**433.67**
of which: FX incl. in assets	58.0%	54.5%	54.4%	55.6%	57.0%	58.5%	55.6%	53.5%
FX for hedging on	21.4%	20.6%	24.4%	28.2%	28.4%	26.0%	25.9%	26.4%
primary FX focus	20.2%	15.8%	10.7%	10.1%	11.7%	15.6%	12.6%	10.8%

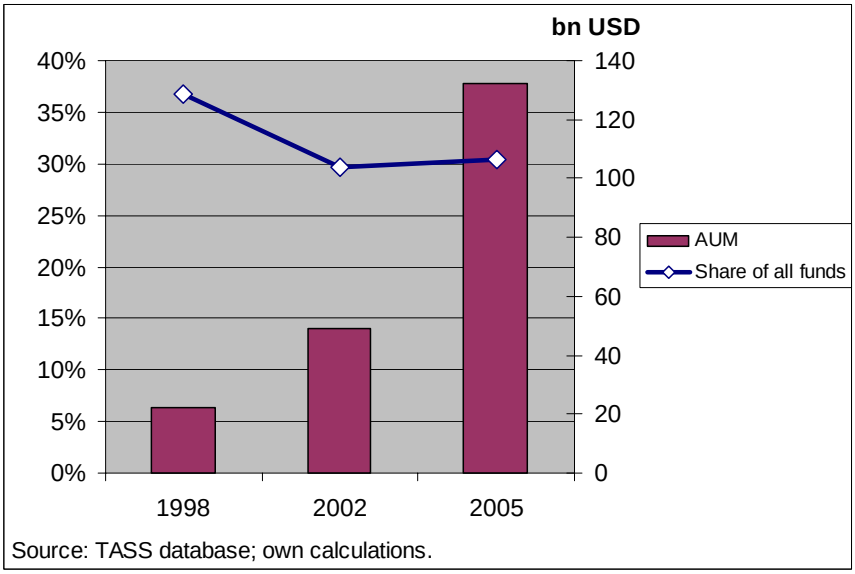
Source: TASS database, own calculations

Figure 4: Assets of hedge funds and percentage break-up by strategy



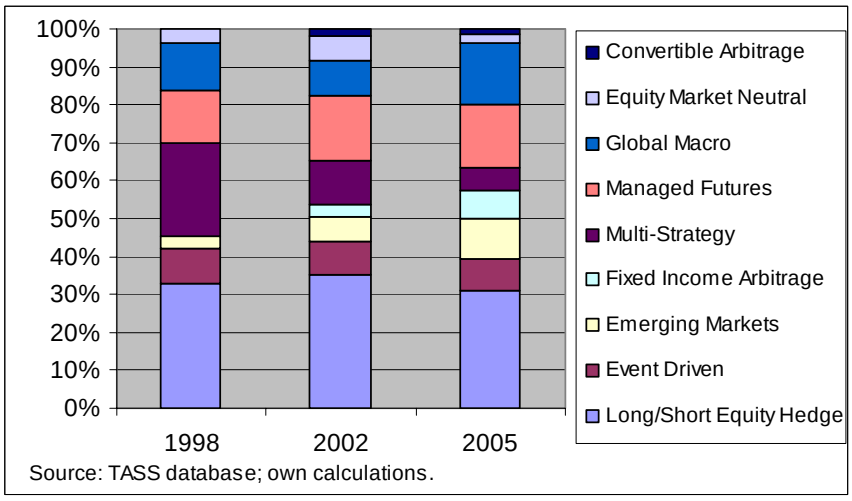
Source: TASS database; own calculations.

Figure 5: Assets and percentage share of funds with currencies included in assets not only for hedging purposes



Source: TASS database; own calculations.

Figure 6: Asset break-up by strategy of funds with currencies included in assets not only for hedging purposes



Source: TASS database; own calculations.

Figure 7: Assets and percentage share of funds with primary focus on currencies

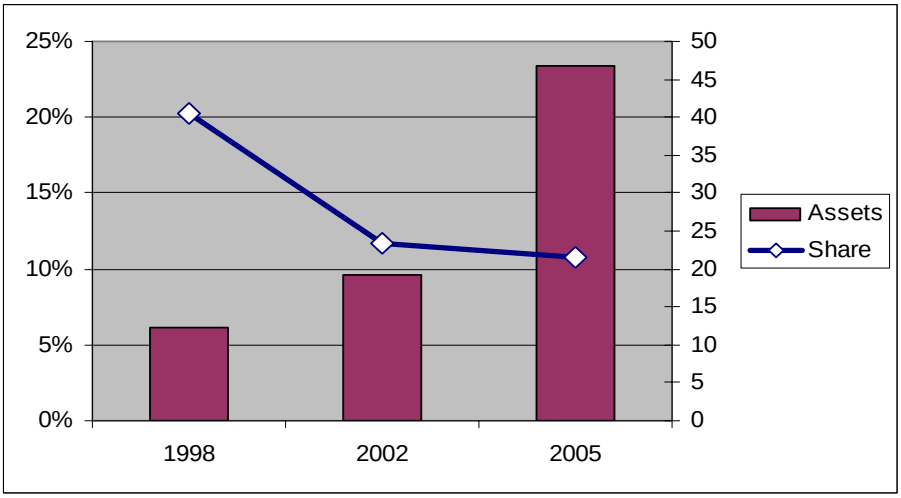


Figure 8: Asset break-up by strategy of funds with primary focus on currencies

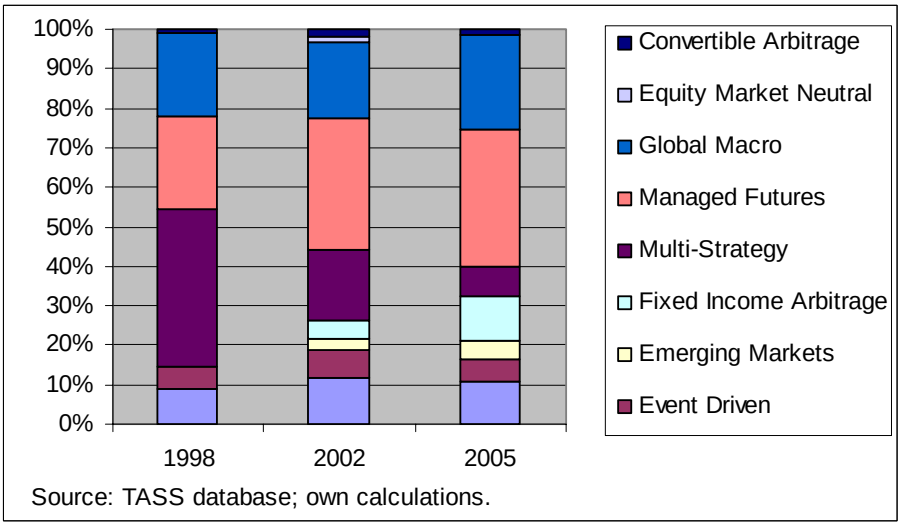


Figure 9: Investment approach used by funds with primary focus on currencies

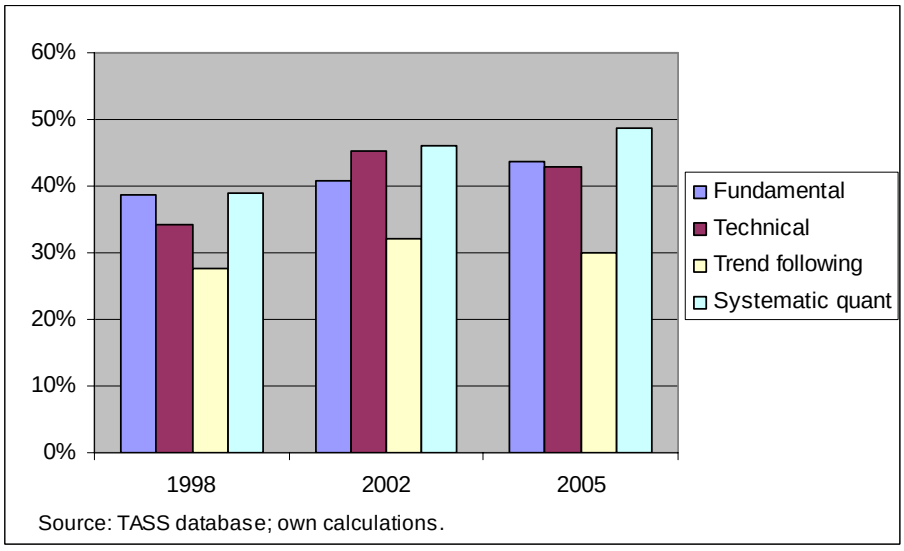


Figure 10: FX instruments used by funds with primary focus on currencies

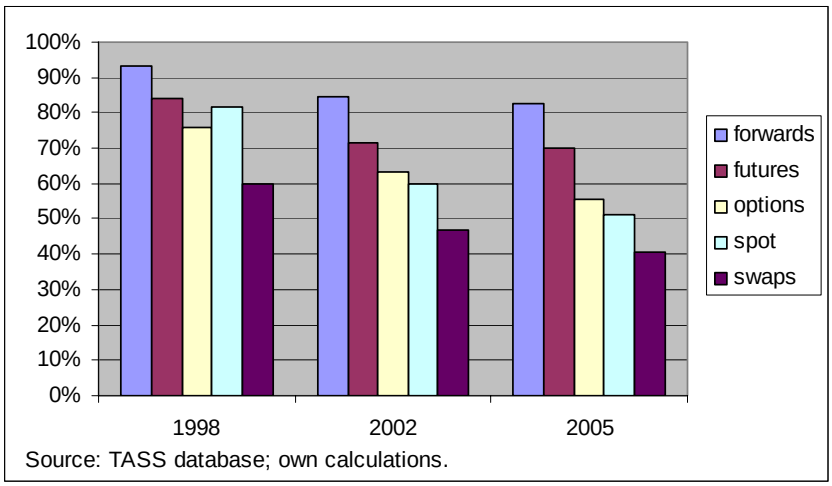


Figure 11: DB Global Currency Harvest Index

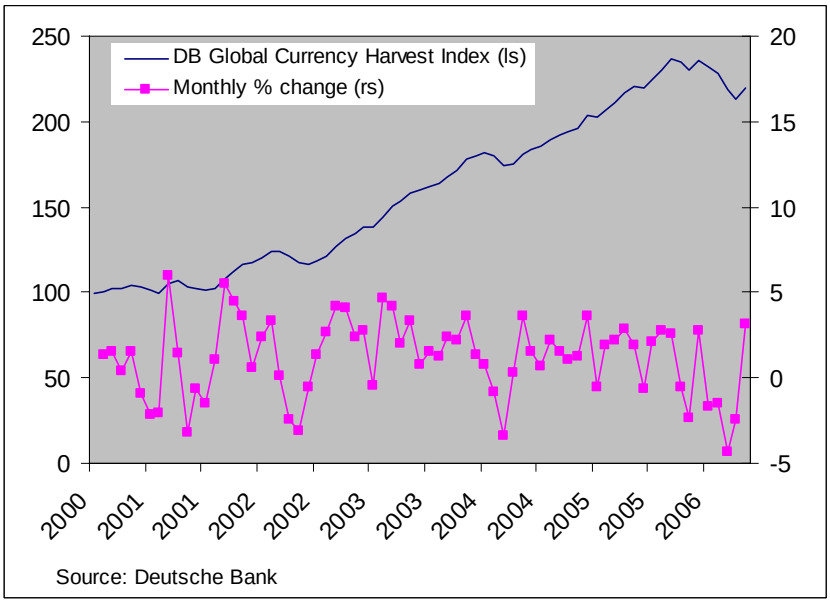
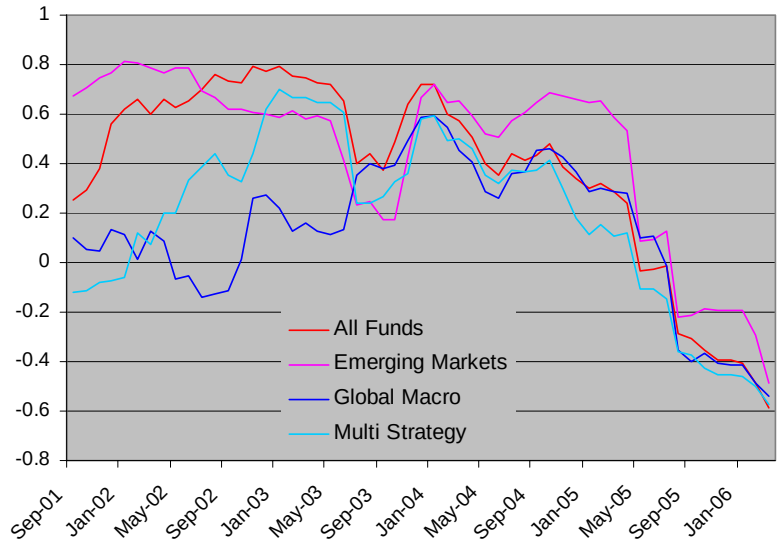


Figure 12: Rolling 18-month correlations of hedge funds returns with DB Global Currency Harvest Index



Median pair-wise correlations between fund strategies and within their FX subgroups[7]

Figure 13: All funds, funds of funds excluded

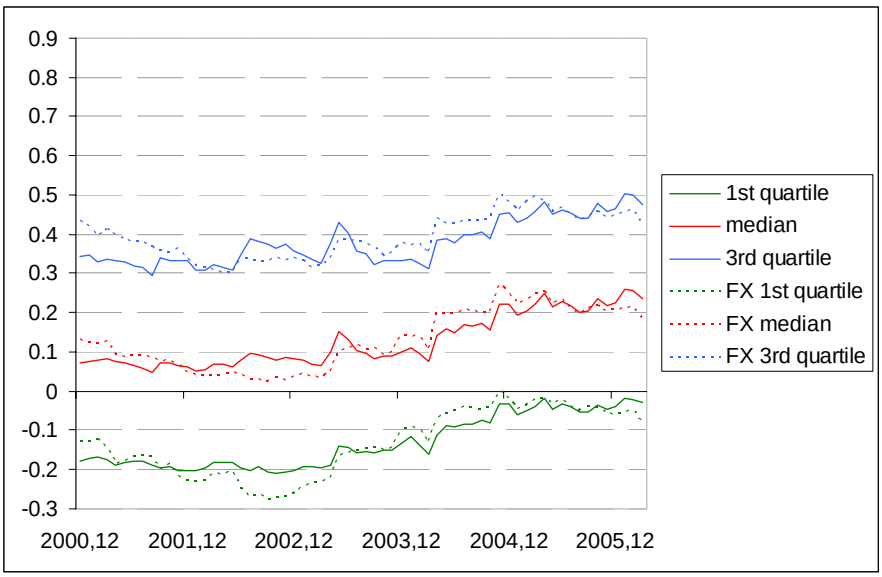
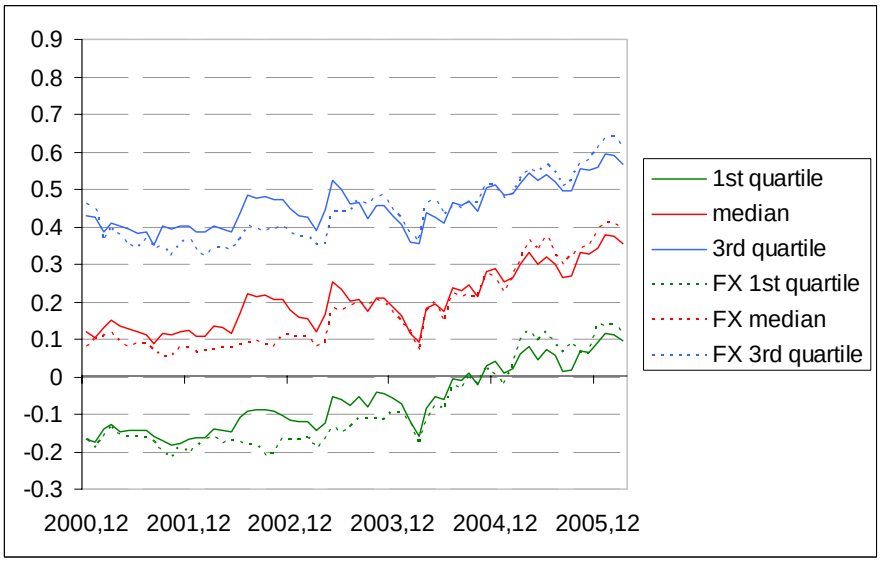


Figure 14: Long/short equity hedge



[7] FX subgroup – funds with currencies included in assets, not only for hedging purposes

Figure 15: Global macro

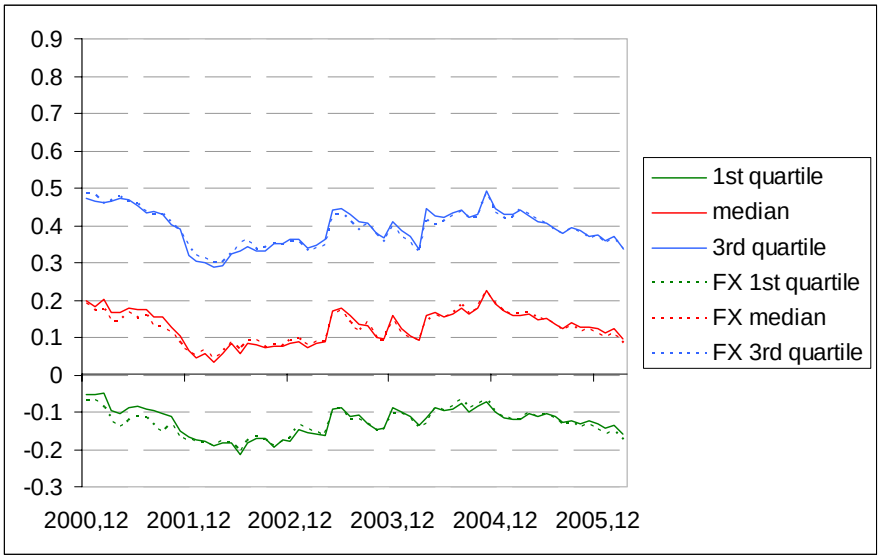


Figure 16: Emerging markets

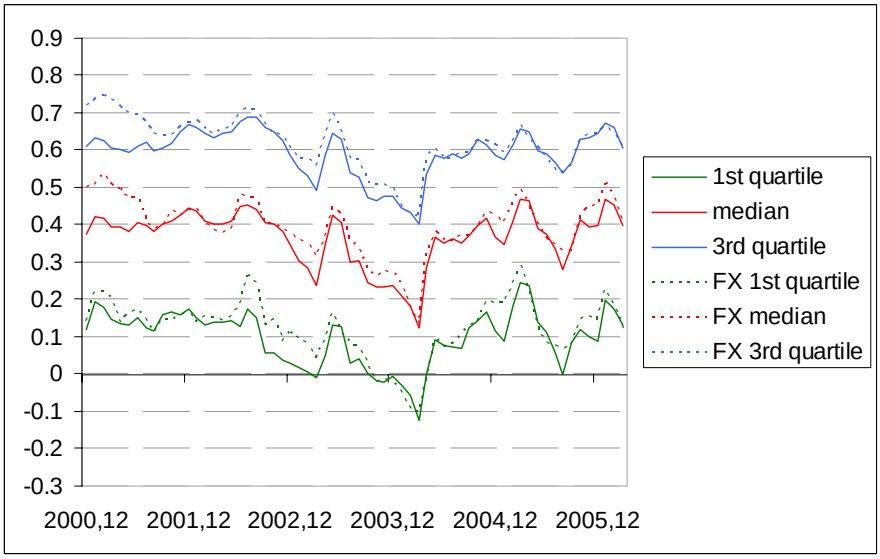


Figure 17: Multi Strategy

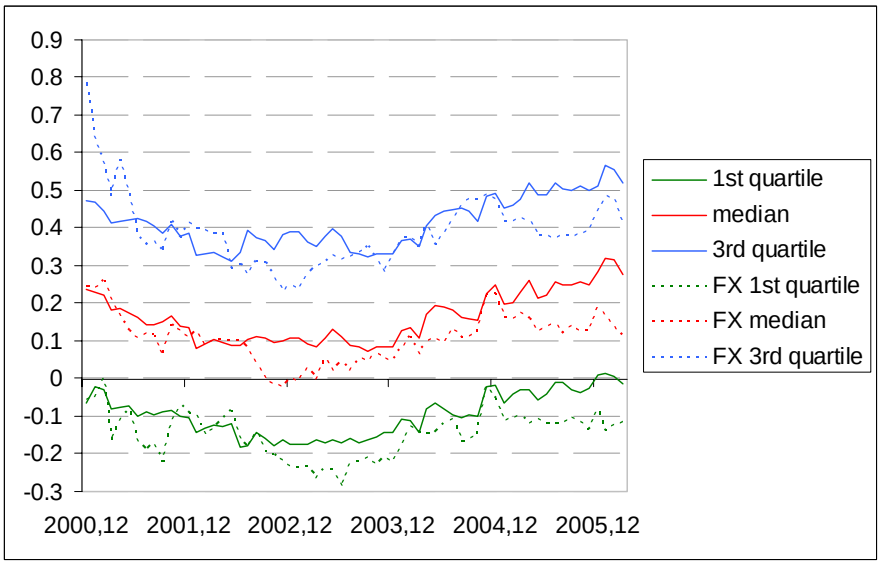


Figure 18: Fixed income arbitrage

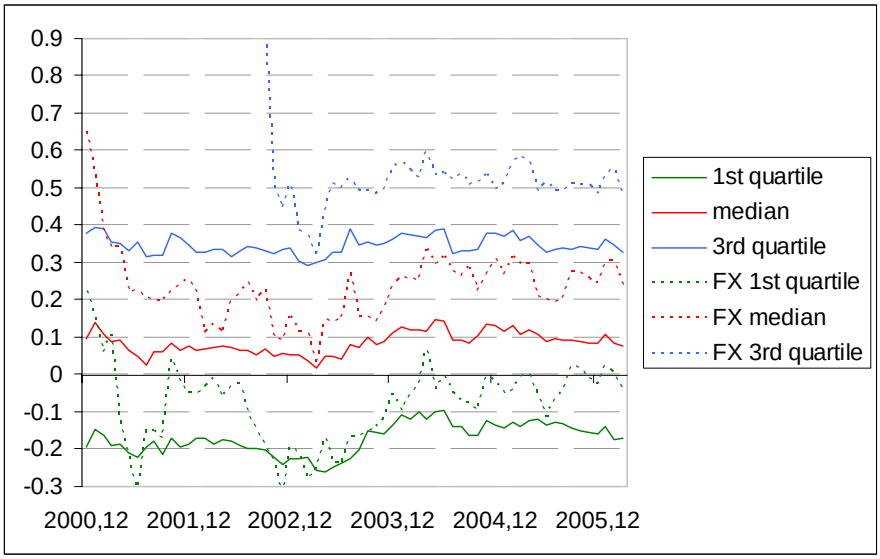
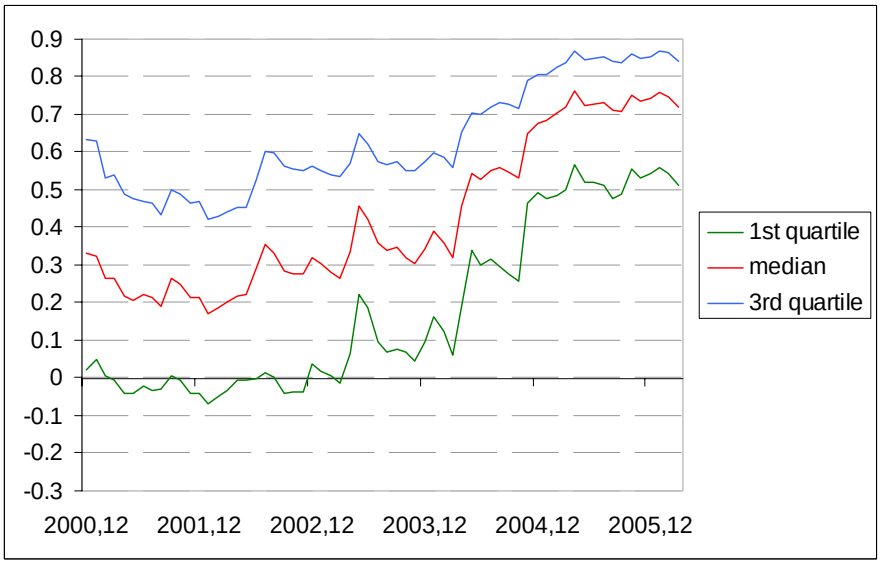


Figure 19: Funds of funds



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